

**REMARKS**

Claims 1-9 and 11-20 are pending in this application. Claims 1-3, 5-7, 9 and 11-18 stand rejected and claims 4 and 8 are objected to. Applicants wishes to thank the Examiner for the indication of allowable subject matter in claims 4 and 8. In light of the remarks set forth below, Applicants respectfully submit that each of the pending claims is in immediate condition for allowance.

Claim 1 is based on Fig. 6A. Notice that in that figure, all of the nodes fit the description of the nodes in the claim. In Fig. 6A, the node C, for example, does not have any buffers so that messages entering node C must immediately exit node C. That means (again referring to Fig. 6A) that when two messages enter node C, one of the messages must immediately travel to node H and one of the messages must immediately travel to node D. However, it is not always possible for a message to travel to node H. That is why in the cited Hesse patent, and also in the original Reed patent, two messages are never allowed to simultaneously travel to node C.

In the topology of the Reed and Hesse patents, two messages are not allowed to simultaneously enter a node. In Fig. 1, which applies to the original Reed and Hesse patents, when node B sends a message to node C, it sends a control signal to node A forbidding node A from sending to node C at the same time. However, the present invention is a major improvement over the inventions of Reed and Hesse.

According to the present invention, messages are allowed to simultaneously travel from nodes A and B to node C. In order for node A to safely send a message to node C at the same time that node B sends a message to node C, node A must have additional information. Node A receives that needed information on line 602 from node E. If the control information carried in line 602 indicates that node H will be free to receive a packet from node C, and if moreover, there is a path from H to a target output for a message entering node C, then both A and B can simultaneously send to C.

Therefore, the control line from E to A contains information that, in some cases, allows node A to send data to node C even when node B is sending data to node C. Thus, the throughput of data in a Multiple Level Minimum Logic network is increased over the throughput in patents 1 and 2 by using additional control lines. This is the basic idea of the present invention and is the reason for the title of the patent.

Claims 2-4 depend from, and contain all the limitations of claim 1. These dependent claims also recite additional limitations which, in combination with the limitations of claim 1, are neither disclosed nor suggested by the cited references and are also believed to be directed towards the patentable subject matter. Thus, claims 2-4 should also be allowed.

Independent claim 16 is also allowable over the cited references. In many networks in the prior art, it is possible for a given node to simultaneously receive messages through all of their input ports. However, if two messages arriving at a node need the same output port, then one of the two messages is sent through that output port and the other message is buffered until the desired output port is available. But a Multiple Level Minimum Logic (MLML) network cannot do this because the nodes have no buffers. In earlier networks, it is always possible for simultaneous reception of data in all of the input ports of a given node because it data can always be sent out of all of the node output ports. That is because each node output port has the property that all of the output ports that are accessible from a message in a given node are accessible from all output ports of that node. That is also not the case in a MLML network because (as stated in the claim) "a plurality of interconnect structure output ports that are accessible from input port  $I_B$  but not from not from output port  $I_H$ . The subscripts once again refer to figure 6A where the input port  $I_B$  is the input port of node C that receives data from node B and line the output port  $I_H$  is the output port of node C that sends data to node H. So Claim 16 indicates that node C can simultaneously receive data from nodes A and node B.

Applicants have responded to all of the rejections and objections recited in the Office Action. Reconsideration and a Notice of Allowance for all of the pending claims are therefore respectfully requested.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application to issue.

If the Examiner believes an interview would be of assistance, the Examiner is welcome to contact the undersigned at the number listed below.

Dated: 1/5/06

Respectfully submitted,

By

Ian R. Blum

Registration No.: 42,336

DICKSTEIN SHAPIRO MORIN & OSHINSKY  
LLP

1177 Avenue of the Americas  
New York, New York 10036-2714  
(212) 835-1400  
Attorney for Applicant

IRB/mgs